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TAIT TECHNIQUE*

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There is perhaps no technique or procedure which is so relatively simple, and yet so often improperly performed than the technique of the Tait system of Dynamic Skiametry. Furthermore, unlike the technique of Static Skiametry, the refractionist is not aware that a fault or a series of faults have resulted in inaccurate findings. For, it is only after a patient has been fogged for some time without success that the conclusion is reached doubting the presence of a Ciliary Cramp. In other words, a diagnosis of a Cramp of a considerable degree may be made in a given case which actually may be only the results of an improper carrying out of the exact instrumentation. Such a condition has no place in an Ocular Examination.

In any phase of the Ocular Examination, never must the technique with the resulting findings be questionable. There is enough judgment and consideration necessary in the feasible application of the refractive findings without complicating the conditions with shady technique.

It is for this reason that the writer proposes to give the exact instrumentation in a Dynamic procedure, which apparently is gaining popularity among optometrists throughout the country. It is hoped, that all who read may obtain the actual True Rx. in the Tait Technique, and realize the value of Practical Objective Refraction.

It is almost obvious that the following conditions must be fulfilled in order to perform a Tait Technique.

(a) Patient between ages of seven to forty with binocular vision.

(b) Tait Scope or any scope modified to comply with the requirements of the technique.

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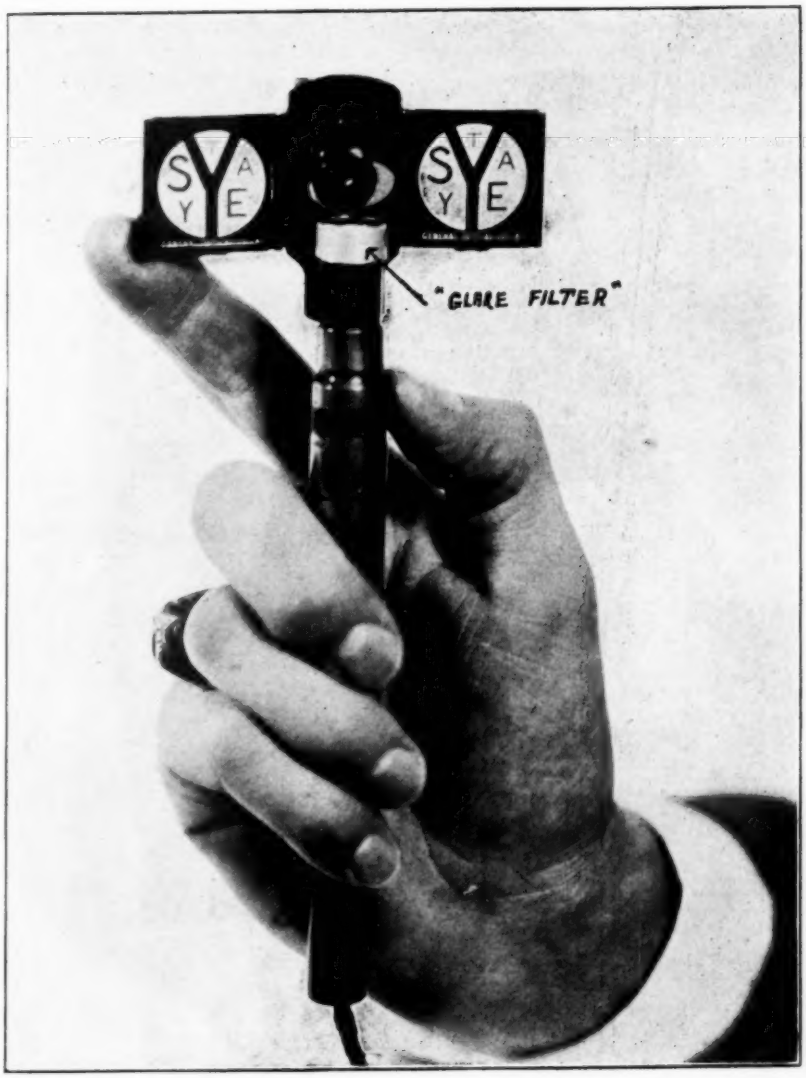
A. C. Whitaker. Fig. 1a. Simplex Retinoscope showing Glare Filter.
See footnote, page 197.

(Ordinary plano mirror self-luminous scope having two charts placed on opposite sides, level with the mirror and having an alternate illumination device. These charts are at a distance of twenty-five mm. from center of mirror to center of each chart. A smoke colored glass may be inserted in the path of the light beam



A. C. Whitaker. Fig. 1b. Simplex Retinoscope showing Glare Filter.
See footnote, page 197.

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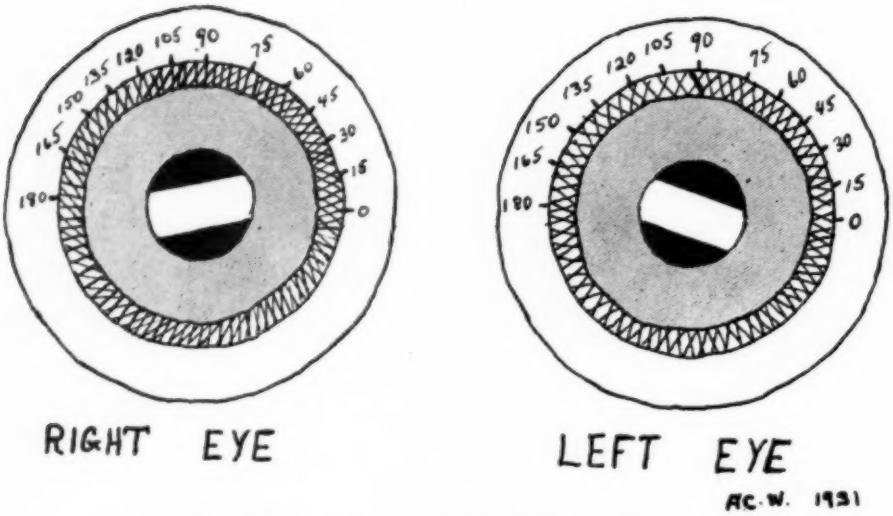
entering the patient's eyes which serves to reduce the glare on the patient but does not interfere with the illumination on the charts. This last feature as shown in Figures 1a and 1b helps to obtain and maintain binocular fixation in those moderate to high exophores at the near point. This special adaptation is not



A. C. Whitaker. Fig. 2. Strait Edged Band of Light.
See footnote, page 197.

yet found on any of the manufactured scopes.)

(c) Keratometer findings properly interpreted.

(d) A Refractor or Phoropter while not absolutely necessary will be found to be very convenient.

(e) A working knowledge of Static Skiametry.

Instrumentation

Fogging Procedure:

Adjust the Refractor (Phoroptor, Phorometer, etc.) before the eyes of the patient and set the P. D. for near (13″) fixation. Insert + 6.00 D. sph. before each eye. This of course produces an artificial myopia in the majority of the cases. Naturally, if it is known that the patient is a myope of a moderate degree, it will not be necessary to start with a + 6.00 D. sph. Here, + 2.00 D. sph. or even zero will produce a fog of sufficient amount. Thus, it may be said, place the patient under a fogging lense of at least 4.00 D. over and above the actual correction for distance. Since, the majority of the patients are moderate hyperopes, a + 6.00 D. sph. over each eye will be found to be a good initial fogging lense.

The writer recommends next adjusting the axis setting device on the instrument to that axis as indicated by the Keratometer. This is done before the room is darkened and thus the examiner will not be required to search for the axis device while the patient is actually being refracted.

The question now arises, shall the expected cylinders (the gross

Keratometer findings modified for Physiological Lenticular Astigmia and Plus or Minus lense effectivity) be inserted in the instrument? This is optional, but there are several reasons why it is not advisable to insert the expected cylinders at this time.

First, if the cylinders are not placed in the instrument, and the amount of the astigmia is above 0.75 D., a beautiful straight edged band will be seen in the Primary Meridian when the spherical lense value has been reduced to an approximation of the High Point. The slope of this band of reflex will show admirably the axis of the total astigmia. This I have illustrated in Figure 2. Every refractionist knows the value of such an objective finding.

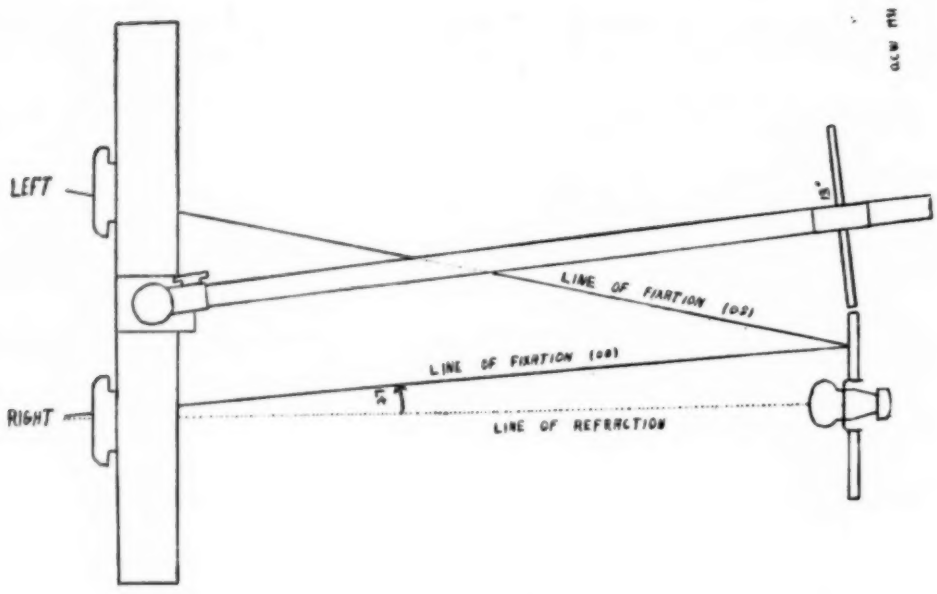
Second: By not placing the cylinders in the instrument, the actual difference in the speed of the against motion for the Primary and Secondary Meridians may be beautifully demonstrated; especially, when the Primary Meridian is near or on the High Point.

Third: By not placing the cylinders in the instrument, the examiner actually neutralizes the Primary and the Secondary Meridians without being prejudiced or biased by already having cylinders in place before the eyes.

The writer insists that the Juniors in their clinical work at the college do not place cylinder values in the instrument at this point. Rather, they are required to first work out or find the actual cylindrical values, and then see how the findings agree with the expected.

Surely, those many optometrists who for years have been employing Skiametry in their various practices, and who are able to see even the slightest difference in the motions of the Primary and the Secondary Meridians, these need not follow this advice. These will quickly see whether or not the cylinders previously inserted are correct. If they are not, they will swing into place those cylinders that do give an equalization of the Primary and Secondary Meridians. Up to this time we have the patient under a 6.00 D. fog and the cylinder axis set into position.

Adjust the near point rod card holder at 13″ on the near point rod. The examiner is to seat himself in front of the patient (at a distance of about 13″) a little to the left (examiner's) of the median line. In other words, when the scope is held in the right hand before the right eye, it will be practically in line with the patient's right eye, as illustrated by Figure 3. Next, light the scope and adjust the illumination on the right (examiner's) chart. The intensity of the illumination entering the patient's eyes should be only of a moderate amount. However, the optimum illumination to procure the most satisfactory reflex will depend on the examiner and should be determined by him. Always remember to use the lowest illumination that gives the best readable reflex. Inform the patient that he is to look at the lighted chart (point to the chart with the index finger). Also, the examiner should proceed to ask questions pertain-



A. C. Whitaker. Fig. 3. Position of Scope. See footnote, page 197.

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ing to this chart. For example, "How many letters are on the chart?" "Are they all the same size?" "What is the largest?" etc. This is the beginning of the refractive technique proper.

The examiner now observes first the right eye and then the left eye. This is done without much of a shifting of the scope either to the right or the left of the median line. This brief procedure tells the examiner whether or not the patient is able to fixate on the right chart with both eyes. It sometimes happens; especially, in using a Refractor or Phoroptor that the scope will be held out of the angle of vision for the eye which is not being refracted or scoped. In other words, if the examiner is too far over to his left while scoping the patient's right eye (probably trying to avoid the multiple lense reflections in the instrument) the left eye will not be able to see the right chart. This condition must not happen: *Binocular convergence and fixation must be in force.*

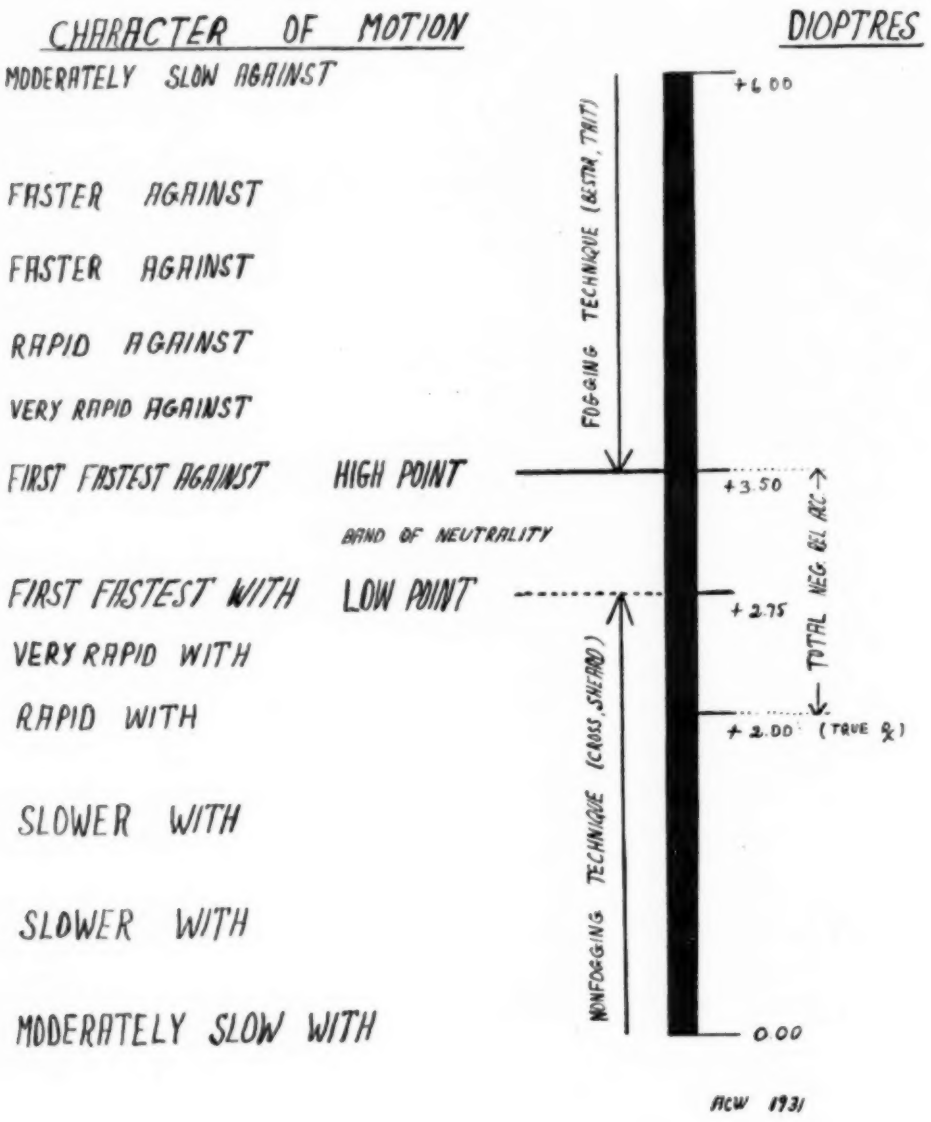
This brief scoping of the two eyes also tells the examiner that both eyes are under a fog of about 2.00 or 3.00 dioptres for the point of fixation. A moderately slow against skiametric reflex motion proves this fact.

The spherical lenses before each eye are now to be slowly reduced, the same amount in each eye, until a fairly rapid against

motion is obtained in each. This insures us that both eyes are under an approximate 1.00 D. fog. With this condition established, we are now ready to find the First Approximation of the High Point and the equalization of the Primary and Secondary Meridians for the right eye.

Note: The right eye while it is coming out of the fog, as we will learn shortly, is being interfered with by the light from the scope. This light is not a blast of light, for even if a small smoke screen, "Glare Filter," on the scope is not used as previously suggested, it is only a miniature bulb. Yet, there can be no doubt that there is some interference with vision and thus with the fixation on the part of the right eye. In order that BOTH eyes will be under an equal interference with fixation, the left eye must be under the hinderance of a 1.00 D. fog. When both eyes are thus under an equal hinderance there is binocular convergence or fixation to the chart at 13". If the left eye were to be brought well out of the fog and the right eye is still hindered by the light of the scope, there is a question whether or not binocular convergence is in force. Conversely, if the left eye were allowed to remain under a very high fog (4.00 to 5.00 D.) for the point of fixation, there would again be a question of the existence of binocular convergence. Remember, in a fogging technique it makes practically no difference whether or not the patient can just read the letters on the chart, or whether he can read the letters well. The only requisite is that BINOCULAR CONVERGENCE to the chart at 13" is present. In other words, the patient MUST NOT have diplopia, or divergence from 13" without diplopia (suppression in either eye).

The variable, convergent-accommodation (that positive accommodation within the eyes which is associated with accommodation) must be maintained as a constant at any given time, in any given case, by the maintaining as a constant its associated convergence to a given fixed point (13"). Under these conditions, the only positive accommodation present within the eyes (under the fogging technique) is that due to convergent-accommodation and to Cramp accommodation, both of which have a positive value in speaking of the eyes. It is also apparent that the dioptric value is NOT the sum of the two, but that dioptric value of the convergent-accommodation under the given conditions of time, fatigue, and convergence. In other words, the Cramp (Ciliary Hypertonicity) is included at the near point by the Convergent-accommodation. The proof of this statement is maintained by Clinical and Private cases wherein a diagnosis of Cramp has been made through the Tait Technique, and a later full correction has been feasible. In conclusion, this fact is apparent that such



A. C. Whitaker. Fig. 4. Character and Speed of Reflex.
See footnote, page 197.

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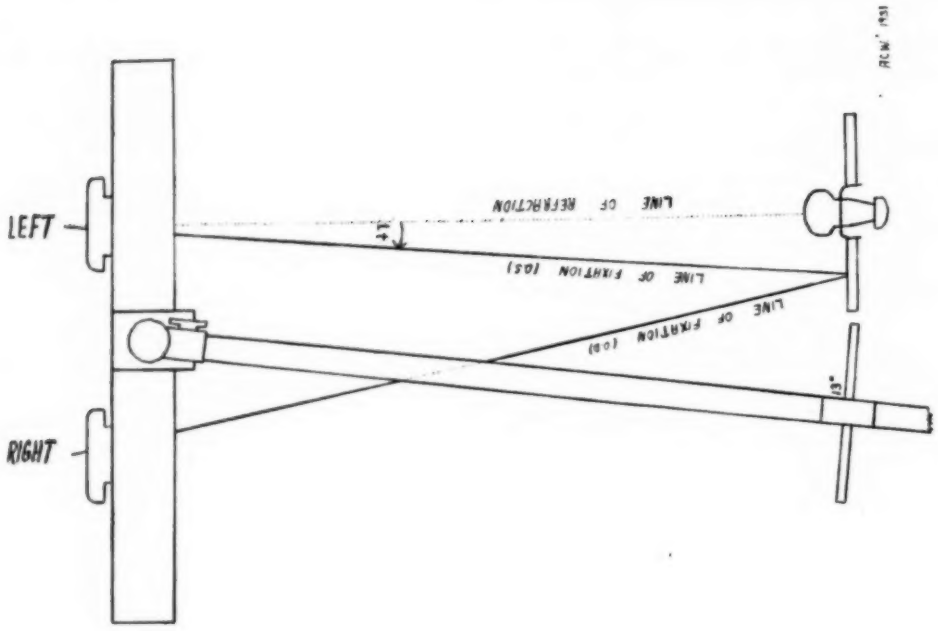
a fogging technique merely manifests a Total Negative Relative Accommodation or negative relaxation over and above the True correction. In a later paper, this point will be further treated.

To obtain the First Approximation of the High Point and the required cylinder values, the following procedure may be employed. Confine the attention (right eye) to the speed of the motion in the Primary Meridian (the meridian of lesser power in the eyes). In "With-the-Rule" Astigmia, this meridian is that nearest the horizontal. Likewise, in "Against-the-Rule" Astigmia, the Primary Meridian is that nearest the vertical. In other words, in the fogging technique the Primary Meridian will show the faster against motion and will thus reach the High Point of Neutralization first. The usual Primary Meridian, because most cases present "With-the-Rule" Astigmia, will be in the 180th, 175th, 5th, 10th, 170th, etc., or nearest the horizontal.

In the Primary Meridian, the examiner must limit his attention to the center of the pupillary aperture. Especially, in those cases where the pupils are fairly large (4 mm.) to large (6 mm.). All those who have employed skiametry know that, especially where the pupils are large, there is a decided difference between the central and peripheral reflex. Reduce slowly the plus sphere in the right eye and scope the Primary Meridian. The motion (against) will increase in speed with each reduction of plus. Finally, an extremely rapid against motion will be obtained which cannot be increased in speed by a slight (0.25) reduction in the plus sphere. This point is called the *High Point* and is defined as, that dioptric value before the eye giving the *First Fastest Against Motion*. In other words, we have entered upon the upper limit of a *"band of neutrality"* or area of same speed of motion. A little experience is all that is required to locate the High Point. The attention is now directed to the Secondary Meridian which is at 90 degrees from the Primary Meridian.

The next step is to equalize the speed of the against motion in the Secondary Meridian by the introduction of concave cylinders (0.25 at a time), with the axis parallel to the fastest against motion (Primary Meridian). It can readily be seen that this procedure adds minus power in the Secondary Meridian and results in an increase of the against motion by decreasing the excessive plus power in the Secondary Meridian. Those who have performed a Static Technique (Fogging) have done this same procedure. However, there is a slight difference.

In the Tait Technique, the examiner works for a *"High Point"* in both the Primary and Secondary Meridians. In other words, the upper edge of the *"Band of Neutralization"* is to be found for the two principal meridians. In many cases the ascertaining of the High Point is facilitated by a change in the color of the skiametric reflex. At the High Point very often the reflex will change from a reddish color to that of a golden hue. Also, an apparent increase in the intensity or brightness of the reflex is noted over that obtained



A. C. Whitaker. Fig. 5. Position of Scope. See footnote, page 197.

when the eyes are under a moderately high fogging lense. Let us assign dioptric values at this time. For example:

O. D. + 3.25 sph. = — 1.00 cx. 15

is found at the First Approximation of the High Point for the right eye. The right eye is now to be placed under a 0.75 or 1.00 D. fog. In other words, the spherical value in the right eye has been increased to + 4.00 D. or + 4.25 D. The examiner is ready to find the First Approximation of the High Point for the left eye.

Shift the illumination from the right (examiner's) chart to the left chart. A position is taken by the examiner similar to that when refracting the right eye. That is to say; hold the scope at 13" opposite the near point rod card holder, move the near point rod a little to the left, and thus the line of refraction for the left eye will be practically perpendicular to the plane of the lenses, as illustrated in Figure 5.

In the Primary Meridian (say the 165th) will be a fairly fast against motion. This is due to the 1.00 D. fogging lense which the reader will recall was allowed to remain in the left eye while the First Approximation was found for the right eye. Reduce slowly the plus spherical power before the left eye. The Primary Meridian

will increase in the rapidity of the against motion. Finally, as in the right eye, a very rapid against motion will be obtained which cannot be increased in speed by a 0.25 D. reduction in the plus power. This is again the upper *"band of neutrality"* or the *"High Point."*

Scope carefully the Secondary Meridian (in this case the 75th). If the astigmia is "With-the-Rule" there will be an against motion whose speed will vary inversely as the amount of the astigmia. Add concave cylinders with the axis parallel to the faster motion which is in the 165th (Primary Meridian). With each increase of the minus cylinders the speed of the against motion in the Secondary Meridian will be increased. Finally, the Primary and Secondary Meridians will be equalized. Thus, a "High Point" or First Fastest Against Motion is obtained in all meridians. Let us say this condition was found with + 3.50 sph. = — 1.00 cx. 165 before the left eye. This value is the First Approximation for the left eye. Fog the left eye about 1.00 D. Assume the same position as that taken when finding the First Approximation for the right eye (Fig. 3).

The time required in the finding of the First Approximation of the High Point for the right eye and then for the left eye (about three minutes), allows the accommodation in force (Convergent-accommodation) to settle down to a fairly constant level or plateau. Perhaps, the patient learns what is required and quiets down. The eyes fixate better and the skiametric reflex improves. It may be that the examiner is getting into the swing of the technique, and thus is better directing his attention to the center of the reflex where a careful interpretation of the character and speed of the motion is to be made. Regardless of what is the true cause, the result is often that a more accurate determination of the High Point is now possible.

We are now ready to find the exact dynamic High Point finding for the right eye. Scope either the Primary (15th) or the Secondary (105th) Meridians with fixation and observation carefully at 13″. It is advisable to change the right chart on the scope to one different from that previously used. The G. O. chart containing several "2's," "3's" and "4's" will do admirably well as a careful fixation chart. It will probably be the more convenient to scope the Primary Meridian, although both meridians should now have the same speed of motion, unless the dynamic total astigmia has changed slightly.

Hold the scope at 13″ and reduce the plus values before the right eye. This will increase the speed of the already fast against motion. Finally, as before, a very rapid against motion will be found which is not increased in speed by the reduction (0.25 D.) of the plus spheres. In other words, that lense value has been found which gives the High Point. It is of utmost importance to check this finding before it is recorded.

If, + 3.50 sph. = — 1.00 cx. 15 was the lense value that gave the

High Point finding for the right eye, this may be verified by employing a very simple procedure which many have used in the Static Technique. Without changing the above lense values, move back with the scope to about 16″. If the previous High Point finding was correct, the reflex motion should be a fairly rapid against. Slowly move in a little closer to the eyes. The motion should increase to a faster and faster against motion. Do not notice the distance from the eyes to the scope, but continue to study carefully the center of the skiametric reflex. Suddenly, the High Point or First Fastest Against motion will be noted. The writer calls this important High Point a characteristic *"Flip"* motion because the shadow "flips" or "flashes" across the pupillary aperture. When the High Point motion is obtained, hold the scope at this distance and note the exact position of the scope according to the near point rod. If the scope is at exactly 13″, the examiner may be certain that the actual High Point has been found.

In using this variable distance fixation—observation check, it is advisable not to move the scope closer than 11″. This unnecessarily close convergence point may produce diplopia for the patient which may or may not be discovered by the examiner. It is obvious that diplopia, or the lack of binocular convergence, will alter the accommodative near point status and produce inaccuracies in the skiametric findings.

The High Point must be accurately ascertained. Since the dioptric values giving the High Point are recorded at the "Gross Dynamic Findings," any discrepancy here will mean that all dynamic findings which follow will also be faulty.

Perhaps those beginning to use the Tait Technique find it rather difficult to determine just when the First Fastest Against (High Point) has been reached. True, some cases are harder to refract or see the skiametric reflex than are others; but, with a little practice anyone can learn to detect the desired High Point "Flip," motion. If everyone will take the time to use the checking procedure (Variable distance) as outlined above, there can be no mistakes in finding the High Point. However, when first performing the Tait Technique, mistakes as high as 2.00 D. have been seen which were detected when the examiner attempted to check the supposed High Point, by changing the position of the scope and noting the character of the reflex.

A finding of + 3.50 sph. — 1.00 cx. 15 was found to be the High Point finding for the right eye. Fog the right again about 1.00 D. and proceed to find the actual High Point for the left eye. The position of the scope, near point rod, and holder will be as shown in Fig. 5. Check the finding by moving the scope out to 16″ and noting if the characteristic "Flip" or High Point motion is obtained

at exactly 13″. If the High Point (First Fastest Against motion) is found beyond 13″ (14″, 15″, etc.) more plus is indicated. Likewise, if the High Point motion is found closer than 13″ (12″, 11″), reduce the plus already before the left eye.

Record the "Gross Dynamic Findings" under the Tait Technique and widen the P. D. of the instrument for distance.

For example:

Tait Technique:

O. D. + 3.50 sph. = — 1.00 cx. 15
O. S. + 3.50 sph. = — 1.00 cx. 165.

The following instrumentation will consider the calculating of physiological allowances which are to be taken from the above "Gross Dynamic Findings." Only an extremely brief discussion of the reasons for these allowances will be included at this time, as such a consideration is not required under Instrumentation.

As reported some time ago by the author of the Tait Technique (American Journal of Optometry, December, 1929., page 676, lines 14 to 16; Summary 4), where a normal accommodative-convergent relationship is present a negative relative accommodation of 1.50 D. has been shown to be present. It must be understood that the additional plus obtained in the "Gross Dynamic Findings" is over and above the "True Correction."

The "True Correction" is that refractive assistance *accepted* by a pair of eyes wherein only a normal ciliary tonicity is present. By the word *"accepted"* we mean that a maximum visual acuity at distance is obtained. In other words, latent hyperopia (Ciliary hypertonicity) is not present in the above illustration; static and subjective findings agree with the True Correction.

Since it has been shown that at least 1.50 D. must be subtracted from the "Gross Dynamic Findings," and that any further allowances will have a relationship with accommodative-convergence (18 — P. E. x) or 18 + P. Es.); and since as shown in the report of the author's (American Journal of Optometry, December, 1929, page 681, line 9) an inverse proportion exists between the amount of the Physiological Exophoria and the amount of accommodative-convergence; furthermore, since a direct fairly straight line relationship exists between the Accommodative convergence and the Negative Relative Accommodation (author's report, American Journal of Optometry, December, 1929, Graph on page 678, the words "Negative Relative Convergence" should read, "Negative Relative Accommodation"); therefore, the Physiological Exophoria (if taken directly after refracting the eyes under a Tait Technique, and ascertained with a definite lense correction) can be employed to determine what

physiological allowances are to be made from the "Gross Dynamic Hight Point" findings.

By definition, the "Gross Dynamic Findings" minus 1.50 D. results in the "Approximate Correction." It is with this, and only this, correction that a phoria test for distance and near is to be run. From these findings the *Physiological Exophoria* is calculated and a further allowance is made from the "Approximate Correction," or a total allowance from the "Gross Dynamic Findings," according to the amount of Physiological Exophoria above the normal (4$^{\Delta}$ to 6$^{\Delta}$).

It is hardly necessary to give the exact instrumentation in the taking of a distance phoria test. However, the method of making a subjective phoria test "somewhat" objective is advisable for control of the patient and accurate results. A brief description of the "Objective-subjective" procedure as advocated and taught by the writer will be given for those not already using this method. There is no claim of originality for this method by the writer.

Place in the instrument the "Approximate Correction" (1.50 D. from "Gross Dynamic Findings") and set the P. D. carefully for distance. Employ a 20/200 "E" at 20 feet for fixation. Swing into place the two Risley prisms, one before each eye. Say to the patient, "Now, Mr.——, you see one 'E'." Turn 6$^{\Delta}$ B. D. in the right eye and also about 12$^{\Delta}$ B. O. in the left eye. (Unless the patient has an esophoria over 12$^{\Delta}$ for distance, the examiner can be perfectly sure of his next statement). "Now, you see two 'E's' and the bottom one is to your right." (Confirmed by the patient.) "Watch very carefully the bottom 'E' and tell me when it moves over directly under the top 'E.'" Reduce slowly the B. O. over the left eye. (Note that the subjective response required from the patient is hidden under a series of direct statements by the examiner.) Let us say that the patient said, "Now," when the left Risley prism showed 2$^{\Delta}$ B. O. Quickly swing about 12$^{\Delta}$ B. I. over the left eye and say to the patient, "Now, the bottom 'E' is over to your left. Tell me, as before, when the bottom 'E' moves directly under the top 'E'." Reduce slowly the B. I. prism over the left eye. The patient will signify again at, or near, 2$^{\Delta}$ B. O. By such a procedure, the examiner has "checked" the patient's answers and at the same time has made a subjective method appear to be somewhat objective. Record the distance phoria finding: 2$^{\Delta}$ eso. at distance.

Set the P. D. of the instrument for near (13″) and use a small "E" or arrow surrounded by small letters, etc., for a fixation object. The procedure for ascertaining the near phoria is exactly as that used for distance. Be very careful to warn the patient to watch closely the bottom letter or object. This results in a fairly steady accommodative effort. Also, make certain that about one minute is allowed for the near phoria to settle down to the highest exophoria or lowest esophoria possible under the existing conditions of lense

correction and fatigue. Record the finding: 4Δ exo. at 13″.

From the distance and near phorias (taken with the Approximate Correction) the *Physiological Exophoria* can now be ascertained. Perhaps the simplest manner to find the Physiological Exophoria is by applying the following definition: "That lack of convergence at near as compared to distance."

While there is a mathematical way of calculating the Physiological Exophoria from the distance and near phorias, the writer thoroughly believes that quicker, more accurate results will be obtained if only the common sense of the above definition is employed. Whenever this definition is applied to any given distance and near phorias there can be but three conclusions or results. In other words, the ratio of the "near convergence compared to that at distance" will take the form of three possibilities.

(1) "An over convergence." (Physiological Esophoria.)
(2) "The same convergence." (Physiological Orthophoria.)
(3) "A lack of convergence." (Physiological Exophoria.)

In most cases, a condition of a "lack of convergence at near" will be found, or in other words, *Physiological Exophoria.* The following examples should be of assistance in teaching the reader to ascertain which one of the three possibilities (P. Es., P. Or., P. Ex.) is present.

2Δ eso. distance
7Δ eso. 13″

5Δ Physiological Esophoria

2Δ eso. distance
2Δ eso. 13″

Physiological Orthophoria

1Δ eso. distance
5Δ exo. 13″

6Δ Physiological Exophoria

To find the Physiological (Eso., Ortho., Exo.) in any given case, the examiner has but to ask himself three questions:

(1) "Is there an 'over convergence' at near as compared to distance?"

Example: 3Δ eso. distance
5Δ eso. 13″

Yes

(2) "Is there the 'same convergence' at near as compared to distance?"

Example: 1Δ exo. distance
1Δ exo. 13″

Yes

(3) "Is there a 'Lack of convergence' at near as compared to distance?"

Example: Ortho distance
6Δ exo. 13″

Yes

In any comparison of a distance and a near phoria either one of the three above conditions will be present. The next question is "How much?" That is to say, after it is determined whether a Physiological (Eso., Ortho., Exo.) is present, assign a numerical value to the ratio. This is in reality quite easy if the conception of Esophoira as the eyes being "in" or, Exophoria as the eyes being "out" is maintained. Test your ability to assign numerical values for each of the three above illustrations. The answers are given to check your answers: (1) 2Δ Physiological Esophoria; (2) Physiological Orthophoria; (3) 6Δ Physiological Exophoria.

After the Physiological (Eso., Ortho., Exo.) for any two phorias (distance and near) can readily be ascertained, the following simplified table can be used to determine how much of a deduction is to be made from the "Gross Dynamic Findings."

P. E. (Taken with Approx. Rx.)	Total Neg. Rel. Acc. (Allowance from "Gross Dynamic Findings")
Low Eso., Ortho., up to 6Δ	1.50 D.
8Δ	1.75 D.
10Δ	2.00 D.
12Δ	2.25 D.
14Δ	2.50 D.
16Δ	2.75 D.
18Δ	3.00 D.

It is not necessary to remember the exact table. One may simply know that a 0.25 D. over and above 1.50 D. is made for every 2Δ of Physiological Exophoria over 6Δ.

Example: P. Ex. 12Δ. What allowance?

A P. Ex. of 12Δ is (8Δ, 10Δ, 12Δ) three steps of 2Δ above 6Δ. Three times 0.25 D. equals 0.75 D.

1.50 D. plus 0.75 D. equals 2.25 D.

Answer, 2.25 D., Total Allowance from "Gross Dynamic Findings."

It will be recalled that a phoria test for distance and near is run with the "Approximate Correction" in place before the eyes. The Physiological Exophoria is calculated from these findings. As previously stated, a further allowance, in addition to that 1.50 D. (Approximate Correction) for the First Major Factor, is made according to the Physiological Exophoria. For example:

P. E.	Allowance from "Approximate Correction"
(Low Es., Ortho., up to 6Δ Ex.)	0.00 D.
8Δ	0.25 D.
10Δ	0.50 D.
12Δ	0.75 D.
14Δ	1.00 D.
16Δ	1.25 D.
18Δ	1.50 D.

Make the indicated reduction in plus, or addition in minus, from the "Approximate Correction" and take the visual acuity for each eye separately. Record the findings and take the visual acuity for the two eyes together. It is recommended that a slight (0.25 D.) reduction in plus, or addition in minus, be made from the "True Correction" and the visual acuity for the two eyes together be again taken.

(1) In "Cramp" cases a relatively large increase in vision for distance is obtained by a slight reduction in the "True Correction."

(2) If an increase, or at least the same vision, is obtained (not a reduction in V. A.) the examiner is assured that during the instrumentation the proper High Point was found and recorded. If a faulty technique were done, such as, coming too far down into the "Band of Neutrality," a lowered V. A. will be found with a slight reduction from the "True Correction."

(3) Apparently, a slight (0.25 D.) "Cramp" or hypertonicity of the ciliary muscle is found in a relatively large number of cases. This low latent hyperopia is easily carried by the average patient without asthenopsia.

(4) Since during the instrumentation the "High Point" findings were taken when an extremely rapid against motion was still found, it is quite possible that the actual or proper "High Point" is slightly (0.25 D.) below that lense value ordinarily understood as the "High Point."

Thus, from the above statements, a useful finding is obtained when a slight reduction is made from the "True Correction."

When we consider the visual acuity for distance obtained with either the "True Correction" or the 0.25 D. from the "True Correction," we will discover that in about 70 per cent of the cases refracted

by a Tait Technique this V. A. is nearly the maximum for each case. In other words, in about seven of ten patients the actual findings ("True Correction") may be prescribed without placing the patient under a disagreeable fog or blur for distance. Such a condition has given rise to the expression that, the Tait Technique means "*Practical Objective Refraction.*" If thoroughly and accurately carried out, the Tait Technique will become the "hub" of the cycle of refractive procedures. The "True Correction" can often be used as a basis in diagnosing and optometrically prescribing for the patient. In the clinics of the Pennsylvania State College of Optometry, Philadelphia, and in the private practices of many of its graduates, the practical application and interpretation of the Tait Technique findings have been firmly established. But what about the 30 per cent of the cases where the V. A. for distance is not normal?

These cases, the moderately high to high latent hyperopes (ciliary hypertonicity cases) must be managed as "*Corrective Cases.*" The procedure is not new. For years, every optometrist has refracted cases where a suspicion of "Latent Hyperopia," "Pseudo Myopia" or "Functional Myopia" was present. True, these exact words were not always used, but yet the examiner truly believed that "more plus" or "less minus" should be prescribed in the case. What was done? It may be that a slight fog of 0.25 D. for distance was given or a small reduction in the amount of minus (in myopes) was made. The patient was cautioned about the foggy distant vision and put under observation.

Today, a definite diagnosis of latent hyperopia or ciliary hypertonicity can be made by a comparison of the "True Correction" with the Static and Subjective findings. This technique (Tait Technique) is both objective and practical. The dynamic findings represent the ultimate or desired correction for the patient. It would be foolhardiness, unbusinesslike, and unscientific to prescribe a full correction in any Cramp case of average to high proportions. It is advisable not to fog any patient over 0.50 D. for distance (Clason .8). If absolutely essential, more plus may be prescribed as prism bifocal segments. Kratometer or Myoculator relaxation exercises have in some cases hastened the time of maximum V. A. for distance with the "Corrective Corrections" or even the "True Correction."

From the writer's experience with the Tait Technique in the past few years, it is apparent that from the time when this final development of dynamic skiametry was first advocated (1923) there has been a gradual development in the *Instrumentation, Interpretation,* and *Application.* It was, as previously stated, because of a sincere desire to see a more wide spread appreciation of the "True Correction" among optometrists that this discussion on *Instrumentation* was begun. In closing, remember, "there must never be a question as to the accuracy of any optometric finding; especially, not

the 'True Correction.'"

At this time we wish to properly accredit the author of the Tait Technique, Dr. E. F. Tait of Philadelphia, for most of the material in this paper on Instrumentation. The writer, through a contact of five years with Dr. Tait has merely reorganized and put into writing the original thoughts and procedures as advocated by the author.

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EXPLANATORY NOTES REGARDING ILLUSTRATIONS IN ARTICLE BY DR. A. C. WHITAKER

FIG. 1 (a) page 180

The writer's modified American Optical Company Simplex Retinoscope (June, 1929). Modeled, with the exception of the "Glare filter" attachment, after a modification of a General Optical Company Ryer Retinoscope by Dr. E. F. Tait, Philadelphia.

FIG. 1 (b) page 181

Side view of the writer's modified American Optical Company Simplex Retinoscope (June, 1929). Modeled, with the exception of the illustrated "Glare Filter," from a modification of a General Optical Company Ryer Retinoscope by Dr. E. F. Tait, Philadelphia.

FIG. 2, page 182

Drawing showing the straight edged band of light in the patient's right eye at axis 15°. This axis is the Primary Meridian in this case.

The left eye is used to illustrate an axis and Primary Meridian at axis 165°.

FIG. 3, page 184

Showing position of the scope at 13″ opposite the near point rod card holder. This insures the examiner that he is working exactly at 13″. Note also, that the near point rod is moved slightly to the right to permit the line of refraction to be practically perpendicular to the plane of the lenses. Thus, binocular convergence is somewhat to the right (patient's) when refracting the right eye. Note the relatively small angle (t) between lines of fixation and refraction.

FIG. 4, page 186

Drawing representing the character and speed of the Skiametric reflex with various lense powers before the eyes. Case illustrated; Aet 25, True Hyperopia 2.00 D., normal Accommodative-convergent relationship (P. E. 6Δ), either with or without a Ciliary Cramp (hypertonicity) from 0.00 D. to 1.50 D.

FIG. 5, page 188

Drawing showing position of scope, near point rod, and card holder which is used to mark the thirteen inch distance. Note the line of refraction is practically perpendicular to the plane of the lenses before the left eye.

AN INTERESTING BUT SOMEWHAT PUZZLING CASE*

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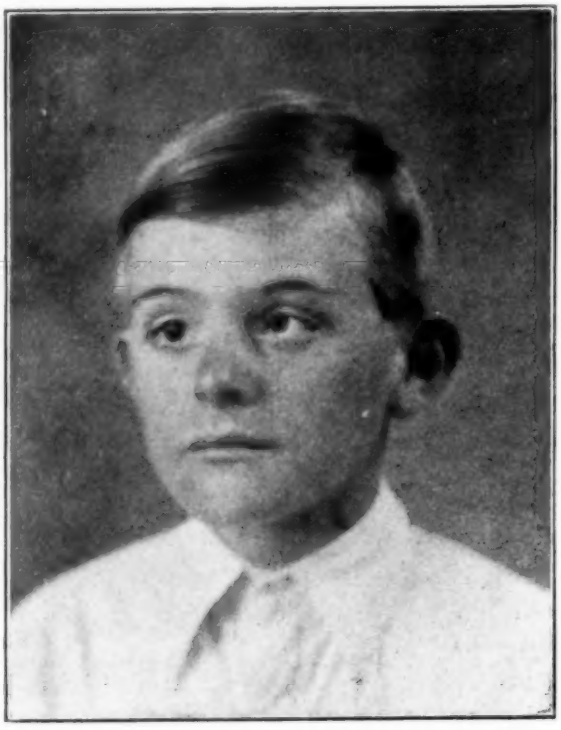
When is a cross-eyed case cross-eyed? This nine-year-old boy was undoubtedly cross-eyed when he came in July, 1930, as the first



F. McFadden. Patient July, 1930.

photograph shows. At that time the acuity of each eye was 70 per cent. He would only accept, statically, R + 1.00 S., left + 1.50 S. with which the vision of each eye was raised only to 75 per cent. There was complete suspenopsia of the left eye at that time, so that

*Submitted for publication April 23, 1931.

it was impossible to determine the true esophoria without constantly wig-wagging the maddox streak. With this in motion, stimulating the motion-sense of vision, there appeared to be possibly 15Δ esophoria although this was quite uncertain.

Treatment consisted at first of having the right obscured for at least two hours daily, meals, playtime, some reading, as he was bookish. Following a light left-to-right and back, in figure-eight, and circularly, his left eye moved jerkily, having very poor co-ordination and disinclination to maintain fixation of a moving object, usually the easiest thing to hold. The photo shows a definite hyperphoria, but this disappeared early in the work.

In fusion development work, the bird would not go into the cage, nor its opposite card, the cage would not go over the bird,

F. McFadden. Patient Jan., 1931.

since the left eye would invariably suspend when the right fixed. We finally obtained the ON—NE on one of the cards, but could not bring about ONE, one month after beginning treatment. A 6Δ base-out with + 1.00 S. over the left eye started to overcome suspenopsia a month after the treatments began and he could now begin to capture the parrot with the cage, using the stereoscope,

while the P and b now fused stereoscopically into B, and the F L finally became E, although there was very frequent lapses by the left eye. We now had indications of about 20Δ Eso. with the maddox bar, the vertical prism, the double prism, and various other checks.

With the row of black balls in the stereoscope, on one test he brought the arrow-and-ball onto 6, but immediately thereafter he was unable to fuse the frames into consecutive rows of figures, since

2	1
4	8
5	1

1	3
8	2
1	6

first one eye and then the other would suspend. Under heavy fog it appeared that he might be crowded to wear + 2.00 S. O. U., but this proved impracticable and was abandoned in favor of the original spherical corrections. He enjoys reading, and was encouraged to keep it up, obscuration of the right being persisted in during a large part of the time.

At this time we were able to determine a 4Δ hyperphoria, but this was partially corrected by a slight rotation of his prism until it entirely disappeared. Three months after beginning work we had the left eye fixing correctly, with an apparent esophoria of the other eye. With this change of character a new instrument was brought forth, it being a device having characteristics of the "reading bar" which consists of a one, two, or three pronged affair strapped to the forehead. This is impractical, since a suspenope will merely turn their head, thereby cancelling any value of the instrument. The device used was developed for similar cases and is a hand-held and book-rested five-bar arrangement which makes it impracticable to slide the compound bar along, and is too troublesome in moving the head back and forth five times to read through a line of print. This compels the suspending eye to maintain fusion and unremitting attention in reading.

In less than three months suspenopsia had wholly disappeared, there had been complete inversion of the phoria, and fusion was readily maintained without any prisms. Now that we had brought about singleness of vision, a true stereopsis, the prisms were entirely abandoned, but reading and some study was required through the compound reading bar.

Six months after work began we had the interesting picture here shown of absolute orthophoria at both distance and near, using the maddox bar, the vertical prism or the double-prism tests. Meanwhile, visual acuity had so far improved that each eye showed easily 100 per cent individually, with 110 per cent visual acuity O. U.

Visits were now cut down from the original weekly period to fortnightly, and later to one each month. He wears O. U. + 1.00 S. without prisms. With a red filter 670 A. U. of the spectral band (4″ brilliantly illuminated disc of corrected white light for fixation), and 470 A. U. blue-green filter before the other eye, these correct complimentary lights fuse into a true white, thereby proving complete abatement of suspenopsia, or any tendency toward diplopia. The photograph was taken under very careful check conditions so that the eyes would correctly maintain binocular fixation while the shot was made. To all appearances we still have an esotrope, but actually the case is absolutely orthophoric. He sees straight, although he looks (to us) crooked. We are obliged to ask ourselves, "When" is an esotrope orthophoric? If this boy had shown a very low acuity of either eye at the beginning, instead of 70 per cent in each eye, we might have said that a new macula had developed, if such things actually happen, although there has not yet been shown any conclusive evidence in that direction. The changing of the esotropia from the left to right also rules out that assumption. That the left eye was an absolute suspenope in the beginning was demonstrated repeatedly with the color filters above mentioned, since it was wholly impossible to perceive either color with the left eye while the right was uncovered, and this characteristic persisted for many weeks. Any increase of the spheres causes difficulty at distance and is of no assistance whatever in reading. Explanations fail signally in explaining exactly what has occurred in this case. Meanwhile the case is not discharged, as indeed the writer never discharges a case. Developmental exercises are soon to be begun to determine if the right eye can be brought round where it *appears* normal, meanwhile carefully checking lest a good thing be overdone and mischief ensue by an exophoric diplopia with *apparent* straightness.

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ASTIGMATISM*

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The purpose of this essay is to stimulate within us[1] all an increased incentive to study the vagaries of this elusive problem, astigmatism.

It is logically assumed that all present have an adequate understanding and a good working knowledge of the principles involved in the measurement of astigmatism by means of both retinoscopic and subjective methods and have also a knowledge of how to measure astigmia with the Ophthalmometer. The difficulty, among us all, is not an inability to arrive at the amount of cylindrical error as manifested by these various methods but the real perplexity has been to understand the significance of the Ophthalmometer reading compared with the accepted cylinder as found by the retinoscopic and subjective methods.

The discussion in this paper will therefore deal principally with the interpretation of the comparative test values between the Ophthalmometer and the auxiliary retinoscopic and subjective tests.

Some space must be devoted in the introductory lines of this paper, to emphasizing the vital importance of searchingly analyzing astigmia since it is not generally viewed with the deep concern its importance justifies.

As to the value of skillfully correcting the cylindrical element, it is definitely basic in importance. Until the astigmia is properly determined and judiciously corrected we can not hope to give the fullest measure of ocular comfort no matter how many auxiliary aids we employ to assist fusion and binocular co-ordination. Without the proper cylinder value as to both amount and axis, we are mislead in our calculations relative to the proper sphere and that delicate sphere cylinder combination all of which exert greater or lesser degree of influence on phorias and ductions.

As an incentive toward a more serious regard for the subject it might be well to state that the proper determination and correction of astigmia requires more skill and analytical judgment than does any other phase of refractive diagnosis. The improper handling of

*Submitted for publication April 25, 1931.

[1]Read before the Phi Chapter of Beta Sigma Kappa at Wichita, Kansas, April 19, 1931.

astigmatism, as is so often the case when the exclusive subjective test is relied upon, contributes more to ocular misery and dissatisfaction than does failure in accuracy of correction of most other ocular anomalies.

Several of our nationally recognized educators have admitted that among refractionists all over the country, the most incorrigible problem with which ocular diagnosticians have to contend is the cylindrical element in refraction, since it offers greater perplexities throughout the entire field of procedure. In coping with our difficult cases and in our clamor to give them relief through orthoptic means, we have become blinded to, or are ignorant of the discomforts which arise as a result of uncorrected lenticular astigmatism. We must not impulsively lose sight of the fact that accommodative disturbances give rise to more discomfort than to extrinsic muscle imbalance. Many people carry comfortably through life, certain pronounced forms of lateral imbalances but when there is an accommodative stress, especially the irregular type caused by lenticular or accommodative astigmia, the eyes will be uncomfortable and the only remedy known to ocular science is to properly correct this irregular ciliary strain by teasing out the latent astigmia and correcting it.

One of a number of case experiences which have shocked me into striving toward a better grasp of this baffling subject was that of a woman thirty-seven years of age with whose eyes I worked for nearly four laborious years ministering refractive aids, fusion, training, orthoptics and some physio-therapy. The fee was unavoidably high because of time and material involved, but the results were glaringly disappointing due to a failure to uncover and correct the latent astigmatism. She continued suffering with headaches and reading stress.

Up to this time all that was accomplished was that of building a tolerance for glasses and of thwarting another nervous collapse. She had never been able to wear any of the glasses which five outstanding Chicago oculists had prescribed and could not wear the first pair I fitted. She had suffered previously two nervous breakdowns which confined her to hospitals one year each time and was approaching another collapse at the time she consulted me. Her eyes were the only traceable cause of her illness. She was rugged with a health status better than the average.

The Ophthalmometer showed consistently throughout the entire period a gross reading of O. U. 2.50 with the rule while the skiascopic and subjective tests revealed only O. D. 25 and O. S. 50 with the rule. Here is a discrepancy between the Ophthalmometer and the accepted findings approximately of 2 D. most of which allowing for deductions of the physiological element, was being compensated through the irregular ciliary cramp or if you please, accommodative

or lenticular astigmatism. This uncorrected latent astigmia was literally disorganizing her nervous system and thwarting her career.

My reasons for following our traditional practice of correcting the accepted finding regardless of Ophthalmometric reading were as follows: Disorganized state of nerves, intolerance of glasses and aversion toward blur. Should I start all over again with the case I would over correct slightly at first, the accepted cylinder and through a series of changes arrive as nearly as possible at the properly deducted full Ophthalmometric reading which would allow 20/20 vision.

Eight months ago, because of increased asthenopic symptoms, I prescribed O. U. + 1.75 cyl. having built around this cylinder the spheres allowing best vision which was 20/40. She returned two months later from a Colorado trip with the vision 20/20-2 and with the report that her eyes and nervous system were the best they had been in years. She has been to me recently with the report that her eyes are fine, headaches seldom, can read with the comfort she has not before experienced in many years. All of the previous work had built up her tolerance, no doubt making the full cylinder correction bearable.

This is not necessarily an exceptional case for if we are analytical we will find many cases among our difficult ones which present to some degree similar problems. I trust the lesson that this offers us will in your opinion justify the space devoted to it in this paper.

In discussing the most important phase of this subject, Ophthalmometry, it is well to point out that the operator who fails to use the Ophthalmometer as a routine test on every case is robbing both himself and the patient of one of the most valuable basic tests. One of the principal reasons for failure to so employ this instrument is a failure to understand the significance of its findings. If its findings agree with the accepted cylinder findings we feel that the astigmatism is correctly determined and to this extent at least one examination is sufficient. If however, there is considerable disagreement between the Ophthalmometer and the auxiliary astigmatic tests we have still more valuable diagnostic information. We are warned to search for the cause of this difference, the first of which might be a lenticular struggle to compensate toward the end of clearing vision.

As to rules governing calculations and application of Ophthalmometric finding the Javal Rule is disapproved. Clinics of Pennsylvania State College of Optometry have never taught the application of Javal's Rule being aware that the rule could be applied satisfactorily only in isolated cases.

Pascal in his book "Modern Retinoscopy" states, "I make no Ophthalmometric allowances according to rules but let the subse-

quent tests modify the Ophthalmometric reading if necessary."

Nott uses a combination of Javal and his own rule which consists of deducting 50 from Ophthalmometric findings up to 3 D. with the rule and adds 50 against the rule. Above 3 D. he uses Javal's Rule.

Neumueller deducts .50 up to 2 with the rule and adds .50 up to 2.00 against the rule. For every additional one diopter above two an additional .25 is added to the alteration.

One or the other of these rules should be employed as a basis for calculation. Because of the many influencing factors which enters into this test the rules must be, of necessity, far from infallible.

The following seven reasons why Ophthalmometer readings do not always agree with the accepted cylinder has been guided in great part by extracts from that masterpiece, "Ophthalmometry," by Dr. E. LeRoy Ryer. This is a book every refractionist should not only possess but study and use as reference from time to time.

First an allowance should be made for distance of lens from cornea which is quite a factor in strong sphero-cylinder combinations. It is upon these two factors which Neumueller bases his allowances on Ophthalmometric reading referred to above.

Second, few cases will tolerate full cylindrical correction of high degree wherein no correction has been previously worn. In such cases the subjective found cylinder should be prescribed with the view of more fully approaching the full latent correction in time to come.

Third, lenticular astigmatism does more frequently exist than is commonly recognized, as an accommodative effort to compensate an existing corneal astigmia. This is the most frequent cause of a discrepancy between Opthalmometer and accepted findings. Whenever evidence warrants, it is good practice in such cases to prescribe a part of the Ophthalmometric finding in excess of the accepted cylinder. This is where both skill and balance of judgment must be exercised. In these latent astigmia cases we have all experienced a needed increase in cylinder power from time to time as the irregular ciliary tension relaxes just as we find periodically needed, an increase in plus power among latent hyperopes. It is also very commonly observed among older people that stronger cylinders are accepted as the accommodation gives way to the influence of age.

Fourth, with extrinsic muscular imbalance where excessive convergence is counteracted by a corresponding excessive pull on the part of the external recti, the corneal curve and consequently the Ophthalmometer reading is altered. This is another reason why we should not attempt to arrive at a cylindrical fitting with one examination when there is a wide discrepancy in cylindrical findings.

Five, we should also consider the pressure exerted on cornea

as result of styes, cysts, swelling or hypertrophied condition of lids, corneal ulcers, scars, inflammation and pterguim.

Six, film of tears has about the same refractive index as the cornea unless compressed by partly closed lids. It is therefore advisable to insist on wide open lids and occasional blinking.

Seventh, another source of variation between Ophthalmometer and the auxiliary astigmia findings is the obliquity, misplaced or tilting of crystalline lens. And we should add that carelessness on the part of the operator in taking the Ophthalmometer reading is a contribution to these variations.

The above are the principal reasons for the differences between our Ophthalmometer and accepted cylinder. We can thus understand why there are disagreements and the cause of fluctuations in cylindrical findings from time to time. The diagnostic value in such discrepancies is the warning given us to search for causes among these influencing factors. Conservative statistics prove that about 50 per cent of the Ophthalmometric readings agree with the shadow and subjective cylindrical findings.

We can readily understand why dynamic skiascopy tends frequently to show less cylinder value than does the static test since more accommodation is employed in dynamic retinoscopy with a tendency to neutralize some of the corneal cylinder value. For this reason static retinoscopy is superior to dynamic in so far as accuracy of cylinder is concerned.

Since in the weaker and moderate degrees of hyperopic astigmatism it is possible for the accommodation to sectionally overcome it and since it is impossible for the accommodation to compensate excessively high degrees, we find more lenticular astigmatism associated with lower and moderate degrees of hyperopic astigmatism than is found with high astigmatic errors.

Hyperopes are not so likely to accept the full cylinder found by the Ophthalmometer while myopes do more frequently accept full error.

If the argument thus far advanced has not convinced the most skeptical mind as to the value of judicially correcting the latent astigmia there is one serious factor that will move every conscientious operator to give this problem intelligent thought, namely, uncorrected lenticular astigmia, a common cause of cataract.

Whether or not the crystalline lens is nourished through Endosmosis as is so popularly believed, it is generally admitted that the nutrition of the lens is definitely impaired as a result of accommodative stress which is a common cause of cataract. This danger of nutritive complications of the lens which results from lens stress should in itself prove a sufficient spur to make determined and discriminative effort in striving to correct the full astigmatic error.

The following example illustrates the type of cases which indicate accommodative astigmia and which thus impairs lenticular nutrition so often resulting in cataracts. One of my cases presented, four years ago, an Ophthalmometric reading decidedly with the rule while skiascope and subjective finding were against the rule. While at that time no opacities were in evidence, the finding alone proved that the accommodation was laboring to compensate corneal malcurvature. The safe procedure at that time was to have prescribed a properly deducted Ophthalmometric reading with the rule around which should have been built the sphere producing the best vision even though such acuity was considerably lowered compared with the accepted cylinder shown by retinoscope and subjective tests. This prescription to be worn temporarily for several months in an effort to break down the irregular ciliary stress with the hopes of restoring normal lens nutrition.

As this was an out-of-town patient who could not co-operate through the aid of the tentative treatment plan I employed the traditional method of prescribing the accepted cylinder against the rule, thus ignoring the Ophthalmometer reading. During the four years I did not see the case until very recently when a lens exploration revealed a substantially developed cortical cataract. This type of case is tragically frequent.

When there is a marked discrepancy between the basic Ophthalmometric finding compared with the retinoscope and subjective tests in which these two latter are comparatively inverse in the direction of against the rule, we can logically suspect accommodative stress resulting in impaired lens nutriment and with the risk of the ultimate and dire consequence cited above.

Ophthalmometer findings must not be treated as a finality but as a basic foundation upon which the balance of the refractive structure is to be erected. This should be followed and interlocked with static retinoscopy and finally dovetailed with the more refining subjective tests.

Both Dr. Skeffington and Dr. Pascal in their books just off the press prove forcefully the indispensable value of comparisons of the various related findings in arriving at a final diagnosis rather than drawing conclusions from any one detached test.

An isolated, unrelated single examination in and of itself is not diagnostic and is questionable in value.

In conclusion the important points to keep in mind as treated in this paper are:

1. The value of judicially correcting astigmia instead of following traditional practices so generally employed.

2. Recognition of the existence of lenticular or accommodative astigmia, an irregular ciliary activity to compensate a corneal error.

3. Ophthalmometry and the interpretation of its vagaries.

4. Risks of unrelieved asthenopia and impaired nourishment of lens by failure to properly correct latent astigmatism.

5. Importance of studying possible cases of marked discrepancy between Ophthalmometer reading and accepted cylinder and the advisability of correcting with some of these cases, a part or all of the properly calculated Ophthalmometric finding over and above the accepted cylinder.

6. The necessity of correlating the various astigmatic tests using the Ophthalmometer as a basis.

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ON THE PRESCRIBING OF INCREASED ABSORPTION LENSES

The staff of the Post-graduate Eye Institute of Chicago have been conducting experimental research during the past several months to determine if possible just what percentage of patients actually require increased absorption lenses. While this research work is by no means as yet complete, the staff of the institute have prepared a preliminary report of the results arrived at up to the present time. These are as follows:

(1) Five per cent of all patients must never wear increased absorption lenses because they definitely decrease their ability to adjust and adapt their eyes to ordinary light contacts.

(2) Twenty-three per cent of all patients must not wear increased absorption lenses until contributing factors such as uncorrected errors of refraction and pathology are corrected, after which the tests are repeated to see which group they will fall into.

(3) Thirty-four per cent are considered normal. These persons are neither hindered nor helped except under extraordinary conditions and they can use increased absorption lenses or not as the prescribing practitioner sees fit.

(4) Twenty-eight per cent definitely require the first shade of

increased absorption lenses since their adjusting and adapting or their comfort and efficiency seems to be increased by them.

(5) Ten per cent require the second and third shades of increased absorption lenses, these cases showing a marked increase of their ability to adapt and adjust their eyes as the darker shades of light absorbing lenses are used.

(6) Eighty-eight per cent of all persons who require increased light absorption in their ophthalmic prescriptions are helped equally as much by the first shade as they are by the second or third shades of these lenses. It is interesting to note that in making these findings, two hundred pairs of lenses were prescribed throughout their investigations.

Additional research work on a large number of patients is now being carried on and if the findings of the preliminary report are substantiated with a much larger group of patients now being investigated, the results will prove of no little value to the profession.

For many years, the question as to when or when not to prescribe increased absorption lenses has arisen in optometric circles, and if the institute can enable optometrists in their offices to make tests during the course of their routine refraction which will classify the patients into one of the foregoing groups, much of the present guess work as regards to increased absorption lenses will be eliminated. Additional findings from the Post-graduate Eye Institute will be awaited with interest by the profession.

C. C. K.

BOOK NOTICES

MODERN RETINOSCOPY, by J. I. Pascal. Published by the Hatton Press, Ltd., 72-78 Fleet Street, E. C. 4, London, England. 279 pages, illustrated. $4.00. 1930.

Pascal has produced in his new book, *"Modern Retinoscopy,"* a noteworthy contribution to optometric literature. Every type of retinoscopy is dealt with at length by this author in a simple, easily understood manner. The illustrations which accompany the text are very well done, their simplicity adding greatly to the value of the book. Any practitioner having difficulty in employing the technic of *"static-retinoscopy,"* as Pascal calls it, should at once secure this volume, as the underlying principles are so clearly presented as to enable any practitioner to easily and quickly master their fundamentals. Despite the fact that his chapters on static retinoscopy are unquestionably as clear a treatise on this subject as has been produced, his findings on dynamic skiametry, as presented in this book, are without question his greatest achievement. Here

one finds a complete mastery of the subject. There are no awkward paragraphs where the author flounders about as is so frequently seen in books dealing with this subject where that unfortunate individual attempts to make his views coincide with those of others who have gone before him. Pascal, having long years of experience in the use of this near point accommodative test and knowing thoroughly its clinical value and having a clear understanding of its advantages and its limitations, sets these down in a remarkably concise and intelligent fashion. Here, too, the reviewer must again remark that the ten chapters dealing with this subject are without a doubt the greatest contribution of the year. Pascal shows just why Dynamic Skiametry can be used in many cases as a substitute for cycloplegics and he also explains just why the dynamic test can be used to show the presence of latent errors of refraction as well as his understanding of the relationship between accommodation and convergence. The photoscope, an observation device, originated by Pascal, is dealt with at some length, as is a type of subjective shadow testing termed velonoskiascopy. In the reviewer's opinion, it is to be regretted that Pascal chose to name this book, "Modern Retinoscopy," instead of using the more widely accepted, "Modern Skiascopy," as our experience leads us to believe that the term retinoscopy is gradually dying out in favor of the more proper term, skiascopy. However, this is a relatively unimportant point and the general excellence of the book, particularly those chapters dealing with static and dynamic work make this text invaluable to every optometrist. Pascal's latest book is, without a doubt, the most comprehensive work on this subject yet produced and shows the result of diligent and successful research.

C. C. K.

INTRODUCTION TO APPLIED OPTICS, by L. C. Martin, D. Sc. Volume 1. Published by Isaac Pitman & Sons, New York City. 325 pages, 194 illustrations. Price, $6.00. 1930.

In his book, "Introduction to Applied Optics," Martin attempts to treat the subject, not in an elementary fashion nor as in a too advanced mathematical treatise. He rather takes an intermediate position. The book is divided into eight chapters. The first four chapters deal mostly with elementary optical theories, general theory of optical systems, the physical study of light and optical images. Chapter five deals with the eye and physiological optics, and in the next two chapters the author discusses reflection, double refraction, polarization, optical glass and lenses systems. The last chapter contains a brief discussion on spectacles. This book will be a welcome addition to the student of advanced applied and physical optics.

J. I. K.

ANNOTATIONS AND SOCIETY PROCEEDINGS

The American Journal of Optometry is the Official Organ of the American Academy of Optometry, as well as the Organ of the Arkansas, Delaware, Indiana, Iowa, Maine, Maryland, Michigan, Minnesota, Nebraska, North Dakota, Oklahoma, Pennsylvania, South Dakota, Vermont and West Virginia Optometric Associations.

The following gentlemen have consented to supply items of interest from their respective sections, acting in the capacity of

ASSOCIATE STATE EDITORS

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A. O. A. MEETS IN SAN ANTONIO

The annual convention of the American Optometric Association will be held in San Antonio, Texas, the week of June 21st to 26th at the Gunter Hotel. The chief speakers will be Professor Ralph S. Minor of the University of California, Dr. O. J. Melvin of Omaha, Nebraska, Dr. Wm. Feinbloom of New York City, Dr. Louis Jaques of San Diego, California, and Dr. Julius Neumiller of the Pennsylvania State College of Optometry.

Dr. J. Fred Andreae, president of the Association, will preside at the meeting which will close on Friday, June 26th, with a special train trip from San Antonio to Mexico and return.

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A NEW CONCEPTION NEEDED

The writer has been watching with no little interest the editor of the Optical Journal of New York who has during the past few months, through the editorial section of that paper, been carrying on a vicious campaign to protect the rights and interests of the medical profession from being invaded by some of the misguided, incompetent, yet well meaning optometrists, who have had the courage to propose that the scope of optometry be somewhat extended so as to enable an optometrist to render the public a more complete ocular service. I personally fail to find any particular reason for this systematic campaign against this certain group of the progressive element in the profession. I cannot bring

myself to believe, as some of our correspondents claim, that this campaign is merely a circulation building stunt for his paper. If it is, then the profession may have to pay dearly for this stunt in the long run. Why our good friend should take it upon himself to place restrictive and limited interpretations upon optometry laws is beyond my understanding.

In an editorial in the issue of May 1st, entitled "Let Us Amend the Laws," the editor tells us that the laws and amendments are passed by the legislature and signed by the executive and not by optometrists, a remarkable discovery indeed, but for the information of the editor I will state that the laws and amendments, whether they be medical, dental or optometric, are *prepared and drafted* by the legislative committees of the various professions involved and are merely passed upon by the members of the legislature. Some modifications, it is true, are made at times by members of the legislature, but in most instances there are no modifications at all.

The fear in the mind of this editorial writer of the Optical Journal is, in the author's opinion, groundless. It is the writer's belief that to propose amendments to optometry laws so as to broaden their scope will in no way injure the profession. This can be shown by the fact that such an amendment, which included the *use of mechanotherapy by optometrist,* was presented to the legislature of one northwestern state by a single optometrist and the legislature passed this amendment without any serious objection.

But even if it were so difficult to amend the optometry laws as our contemporary tries to make us believe this should not stop progressive optometrists from carrying on their work of broadening the scope because what has been advocated is namely the correction and treatment of *physiological ocular abnormalities* through the *application of physical agents* or any other means than the use of drugs or surgery. This is already covered by most of the optometry laws we have on the status books today. This is especially so if the editor quoted will be so generous as to give such a liberal interpretation to the various other optometry laws as he did with the optometry law of the state of Texas. The reason why the editor should favor the state of Texas to the exclusion of the rest of the United States in handing down his legal interpretation of the law can be seen much easier than the reason for his vicious campaign against certain members of the progressive element in optometry. As a practicing optometrist, I have no quarrel with him if he wishes to see the commercial element survive. As editor of a purely trade paper his interest and sympathies naturally are in that direction and no one should try to stampede him into the belief that *Optometry in 1931 cannot and must not be practiced* the same as in 1900, on the other hand, the writer believes that it is not fair to the profession of optometry for him to carry on such a campaign of this nature against certain men who are trying to put optometry on a finer

professional footing and if there is some disagreement as to the method of approach to this most intricate and most important problem let it be discussed at the conventions and in the conference rooms by practicing optometrists, who from contact and experience learn more of the need of the profession than can one who spends his entire time reporting. I believe the editor of the Optical Journal to be sincere but grossly mistaken in the campaign he carries on against optometric progress. Not only is he hindering the profession but he is actually hurting it. He is furnishing, through these editorials, ammunition to the optical guild, to the tabloid papers, and to all other enemies of our profession, and by his writings is naturally encouraging enemies of our profession to be more bold in their attacks. As a profession optometry has changed and a new conception of our duties and problems is needed.

J. I. K.

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INDIANA STATE ASSOCIATION OF OPTOMETRISTS

The Indiana State Association of Optometrists will hold a special meeting at Lake Wawasee on June 28th to 30th. Dr. George S. Grubb, president of the society, will preside and Dr. Ralph L. Dublin, past president of the Rochester Optometric Society, will be chief speaker. There will be a registration fee of three dollars.

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OKLAHOMA ASSOCIATION OF OPTOMETRISTS

At the 26th annual convention of the Oklahoma Association of Optometrists the following men were elected: Dr. C. H. Beavers, president; Dr. R. A. Dieman, vice-president; Dr. E. B. Alexander, secretary-treasurer; and Dr. E. B. Ross, chairman of the executive committee.

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A NEW ORGANIZATION

The report which follows has been recently received. The author of this report is a man well known in optometric circles for his sincerity of purpose and for his integrity. Dr. Samuel H. Robinson of Prescott, Arizona, author of the book "Oculo-Prism Treatments" is again coming to the profession with an idea which we believe merits the sincere thought and study of every practitioner in America.

C. C. K.

ANNOUNCING THE ORGANIZATION OF "THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF OPTOMETRY."

In view of a pressing need for the extension of Optometry's ser-

vice to the public, we desire to announce the organization of "The American Association for the Advancement of Optometry." This body seeing neither wisdom nor propriety in adhering to outworn, traditionally self-imposed restrictions, will seek to foster the following objectives: First, to create a truly professional spirit among practicing optometrists; second, to limit the field of refraction to those specifically trained in that work; third, to eventually embrace a practice analogous to dentistry.

Those who are committed to this task are not unmindful of the criticism to be engendered in some quarters. However, as no wrong inheres in a desire to progress, such hostility will arouse no fear nor slacken our effort. Through the co-operation of those who have vision and courage, as well as through such support as institutions of learning must lend us, we hope to see our efforts crowned with success. Optometry has long passed the stage of mere glass-fitting. Four and six year college courses must equip the graduate for a broader field of usefulness than the mere prescription of a pair of lenses.

We can no longer be content with the self-deception induced by flamboyant claims regarding the range of service permitted by refractive technique and orthoptic training. As regards the former we can look ahead only to vague refinements, and perhaps a bit more satisfactory spectacle lens; concerning the latter, those who know, find there is little there upon which to build an outstanding profession. Our success can be attributed not so much to our notable service, as to the essential nature of our work. A relatively few, however, commercializing the field, and appropriating a substantial volume of this business, can lay claim to anything like satisfactory economic returns. We can find relief from a situation of this kind, first, by making this work available *only* to those who have proved their qualifications; second, by increasing the range of service for those who despite an ever-increasing educational requirements are permitted nevertheless, the single duty of prescribing a pair of lenses.

Optometrists have the moral and practical obligation to remedy this condition. We do not know whether our progress be slow or fast. There is ample reward in the consciousness that we have been instrumental in supporting a grand and noble cause. As we strive towards our goal, all who take part, become inevitably better practitioners even in the limited work they now do. Those who oppose must suffer forever the ignominy of having passively or actively hindered the greatest forward step in the life of the optometric profession.

Those who desire further information upon this subject may address the chairman.

S. H. ROBINSON, Opt. D., Chairman,
The American Association for the Advancement of Optometry.

611 MAPLE ST.,
PRESCOTT, ARIZONA

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